

**Safety Evaluation by the DOE Regulatory Unit (RU)  
of Proposed Authorization Basis Amendment Request  
ABAR-W375-00-00012,  
"Tailor SRD Fire Safety Criteria and Associated Implementing Standards"  
(DOE Contract DE-AC27-96RL13308)**

## **1.0 INTRODUCTION**

The River Protection Project Waste Treatment Plant (RPP-WTP) will treat and immobilize high-level (radioactive) waste (HLW) contained in underground tanks at the Hanford Site. Requirements for the treatment and immobilization of the waste are contained in the Contract.<sup>1</sup> The Contract requires the Contractor to maintain the authorization basis current with the design. The authorization basis includes the safety criteria and implementing codes and standards identified in Section 4.5, *Fire Protection*, of the Safety Requirements Document (SRD).

In accordance with the requirements of RL/REG-97-13, *Regulatory Unit Position on Contractor Initiated Changes to the Authorization Basis*, Rev. 6, BNFL submitted an Authorization Basis Amendment Request (ABAR) proposing to tailor the safety criteria in Section 4.5, "Fire Protection," of the SRD and the requirements in the associated implementing standards.

## **2.0 BACKGROUND**

In the SRD, BNFL defined safety criteria (4.5-1 through 4.5-23) and associated implementing codes and standards related to Fire Protection. ABAR-W375-00-00012 proposes the following tailoring to these safety criteria and implementing codes and standards:

- Revise all of the SRD, Section 4.5 implementing codes and standards to add "as tailored" at the end.
- Revise Safety Criterion 4.5-4 to clarify that the determination of program interruption acceptability will be made by BNFL, Inc.
- Revise Safety Criteria 4.5-15 and 4.5-22 to replace "fire brigade" with "emergency services organization."
- Tailor implementing standard DOE G-440.1, *Implementation Guide for Use with DOE Orders 420.1 and 440.1*, to clarify that the RU is the Authority Having Jurisdiction (AHJ) for safety/regulatory-related fire protection requirements/issues; clarify that the 1997 version of the Uniform Building Code is the "applicable building code" for the project; and delete requirements dealing with loss potential, program interruption acceptability, property protection, recovery potential, and program discontinuity.
- Tailor implementing standard DOE-STD-1066-97, *Fire Protection Design Criteria*, to clarify that the RU is the Authority Having Jurisdiction (AHJ) for safety/regulatory-related fire protection requirements/issues; delete requirements dealing with loss

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<sup>1</sup> Contract No. DE-AC27-96RL13308, between DOE and BNFL Inc., dated August 24, 1998.

potential, property protection, and program interruption acceptability; clarify fire barrier penetration testing requirements; clarify that BNFL, Inc. is responsible for determining the need for specific fire protection features; clarify maximum travel distance requirements; clarify fire protection requirements for electrical power service; and delete non-applicable requirements of the standard.

- Tailor implementing standard NFPA 801-95, *Standard for Facilities Handling Radioactive Materials*, to clarify that the RU is the Authority Having Jurisdiction (AHJ) for safety/regulatory-related fire protection requirements/issues, update the standard requirements for noncombustible surface finishes to the 1998 version of the code, and change the code edition of referenced NFPA codes to be consistent with other SRD safety criteria.

### 3.0 EVALUATION

The analysis associated with the RU review of the proposed tailoring contained in ABAR-W375-00-00012 is in Appendix A. As discussed in Appendix A, the RU found the proposed changes to be partially acceptable.

In summary, those changes which the RU found to be acceptable include:

- Clarification that the Authority Having Jurisdiction (AHJ) for fire protection-related safety/regulatory matters is the RU.
- Replacement of the requirement for a facility fire brigade with a requirement for an emergency services organization as part of the facility fire protection program.
- Clarification that the "applicable building code" for the RPP-WTP project is the 1997 edition of the Uniform Building Code.
- Clarification that the Contractor may seek omission of automatic fire extinguishing systems based upon valid safety considerations and as approved by the AHJ (RU).
- Replacement of the reference to "critical process equipment" with "important-to-safety equipment" for consistency with DOE-RL-96-0004, *Top-Level Radiological, Nuclear, and Process Safety Standards and principles for the RPP Waste Treatment Plant Contractor*.
- Clarification that the fire resistance for special or unique penetration assemblies may be based on an adequately justified equivalency evaluation approved by the AHJ (RU).
- Clarification that the maximum 75-foot travel distance specified to protect personnel from exposures due to accidental breaches can be exceeded in areas not normally occupied, where plant equipment alone is located.

- Clarification of fire protection requirements for electrical power services to the process building.
- Deletion of non-applicable requirements of the implementing standards.
- Updating of the NFPA 801 code requirements dealing with the combustibility of surface finishes in areas processing or storing radioactive materials.
- Correcting referenced NFPA code editions for consistency with other SRD safety criteria.

These changes have been discussed between fire protection personnel from the RU and the Contractor in two information exchange meetings. The changes are considered consistent with fire protection practices used elsewhere in the DOE complex and/or in the commercial nuclear industry. Also, the changes do not result in a degradation of facility fire safety.

In summary, those changes which the RU found unacceptable include:

- Identifying each SRD Section 4.5 implementing code and standard "as tailored." However, an acceptable approach to the RU is to identify the specific SRD Appendix C section containing the specific implementing code/standard tailored requirements after the words, "as tailored in."
- The deletion of safety criteria and implementing standard requirements dealing with loss potential, program interruption acceptability, property protection, recovery potential, and program discontinuity.
- The addition of words to Section 5.3.1 of DOE-STD-1066-97 which would allow the Contractor to omit installation of an automatic fire suppression system, if justified by the facility FHA. The section, as currently written, makes it clear that such an omission would not be acceptable in this instance.
- The revision of implementing standard requirements which currently assign the responsibility for determining specific fire protection features to the AHJ (RU) rather than to BNFL.
- The request for a blanket equivalency that a minimum 2-hour fire barrier used in conjunction with automatic fire detection and suppression provides equivalent fire safety to a 4-hour fire barrier. While the RU agrees that there may be a defensible basis for this equivalency, safety analysis results required to provide that basis were not provided with the amendment.

Additional details on the reasons that the RU finds the above proposed tailoring to be unacceptable are provided in Appendix A.

#### **4.0 CONCLUSION**

The RU concluded, based on the considerations described above and in Appendix A, that for the proposed tailoring that is identified as acceptable to the RU, BNFL has adequately demonstrated

with reasonable assurance that the health and safety of the public and the workers will not be endangered by the proposed tailoring and the proposed tailoring will not have a significant effect on the environment. That proposed tailoring complies with applicable laws, regulations, and requirements, and conforms to DOE-stipulated top-level safety standards and principles.

**Appendix A**  
**Detailed Evaluation of ABAR-W375-00-00012**  
**Tailor SRD Fire Safety Criteria**  
**and**  
**Associated Implementing Standards**

The purpose of this appendix is to document the detailed examination of the changes proposed by ABAR-W375-00-00012 and the rationale for acceptance or rejection of the changes. The appendix is organized by individual change, beginning with the proposed changes to SRD section 4.5 safety criteria. The following sections of this appendix provide the results of the RU examination of the proposed tailoring of the requirements of the following fire protection implementing standards:

- DOE G-440.1, "Implementation Guide for Use with DOE Orders 420.1 and 440.1, Fire Safety Program."
- DOE-STD-1066-97, "Fire Protection Design Criteria."
- National Fire Protection Association Standard NFPA 801-95, "Standard for Facilities Handling Radioactive Materials."

Safety Criteria 4.5-1 through 4.5-23

The proposed change to all of the SRD section 4.5 (Fire Protection) safety criteria is to add "as tailored" after each implementing standard.

These changes are not acceptable because, as proposed in the ABAR, the tailoring of the implementing standards is open-ended. However, amending each of the proposed changes as follows: "as tailored in Appendix C, Section X" is acceptable to the RU. Section X is a placeholder for the final section number applied to the SRD Appendix C sections for implementing standards DOE G-440.1, DOE-STD-1066-97, and NFPA 801-95.

Safety Criterion 4.5-4

This criterion requires that automatic fire extinguishing systems shall be included in all areas subject to loss of Safety Design Class systems, significant life safety hazards, or unacceptable program interruption, unless the Fire Hazards Analysis dictates otherwise.

The proposed change is to add a second sentence to the safety criterion as follows: "For the RPP-WTP Project, the determination of program interruption acceptability is made by the owner, BNFL Inc."

This change is not acceptable. Because of the Department of Energy's (DOE) decision to terminate the contract with BNFL to design and construct the RPP-WTP and uncertainty about the contracting arrangement to be established with the replacement contractor, the proposed change is no longer warranted.

Safety Criterion 4.5-15

This criterion requires that the fire protection program will include:

1. Organization, training, and responsibilities of the fire protection staff, including a trained and equipped fire brigade.
2. Inspection, testing, and maintenance of all fire protection systems by personnel properly qualified by experience and training in fire protection systems.
3. Surveillance to ensure that fire barriers are in place and that fire suppression systems and components are operable.
4. Training of all employees in basic fire safety.
5. Periodic performance of fire drills.

The proposed change is to replace the requirement for a "fire brigade" in item 1 with the requirement for an "emergency services organization."

This change is acceptable to the RU. The RU has understood for some time that BNFL was planning to establish a formal interface with the Hanford Site Fire Department to provide fire fighting; fire systems/equipment maintenance, testing, and inspection services; etc. rather than to implement a facility fire brigade. The "emergency services organization" terminology better describes the breadth of services (e.g., fire fighting; fire systems/equipment maintenance, testing, and inspection; HAZMAT response) that the RPP-WTP Contractor must establish via a formal interface(s) and provides the Contractor with appropriate flexibility in attaining these services.

Safety Criterion 4.5-22

The criterion requires that the facility should have on file, and ready to use, a Pre-Fire Plan. The criterion states that the Pre-Fire Plan should assign individual and alternate responsibilities for responding to a fire alarm or call; assessing the situation, suppressing incipient fires, assembling the site Fire Brigade, and if necessary, requesting Hanford Site fire department assistance, personnel evacuation, orderly shutdown of processes, and safeguarding (if necessary) and control of radioactive and hazardous material.

Further, the criterion states that the Pre-Fire Plan should clearly indicate, preferably with the help of site plans and drawings, the locations of the fire department-compatible connections and fire-fighting equipment, such as portable extinguishers, automatic fire suppression systems, sectional valves, standpipes, hydrants, and hoses. It should also indicate the areas of concentrations of combustibles, storage of flammable and combustible liquids, and areas where use of water for fire suppression is restricted because of nuclear criticality or other concerns.

Lastly, the criterion states that the Pre-Fire Plan should be prepared in consultation and coordination with the Hanford Site fire department. The Hanford Site fire department personnel should be given familiarization tours of the facility at least once a year.

The proposed change is to replace the requirement for a "site Fire Brigade, and if necessary, requesting Hanford Site fire department assistance" in the first paragraph of the safety criterion with the requirement for an "emergency services organization."

This change is acceptable to the RU for the same reasons discussed above for the proposed change to safety criterion 4.5-15.

#### DOE G-440.1

The proposed tailoring of this DOE guide includes one general interpretation and seven (7) specific interpretations, as follows:

##### General:

Interpret references to "DOE" or "DOE AHJ" or "AHJ" as "DOE Regulatory Unit (RU)" wherever these references refer to regulatory functions that have been assigned to the DOE Regulatory Unit.

This interpretation is consistent with the position taken by the RU in Level 1 meetings with BNFL and is acceptable. It clarifies the RU as the AHJ for safety/regulatory-related fire protection issues, while leaving other AHJ responsibilities (i.e., maintenance, testing, inspection of fire protection equipment, fire fighting, permitting, etc.) to other appropriate organizations (e.g., Hanford Site Fire Department).

##### Section III.5.0:

This section of the guide states that DOE facilities and sites should meet the applicable building code and National Fire Protection Association codes and standards, unless explicit written relief has been granted by DOE. The section states that the applicable codes and standards are those in effect when facility design commences ("code of record") and that when significant modifications to a facility occur, the current edition of the code or standard should apply to the modification.

The proposed tailoring is to add the following words at the end of the paragraph: "The applicable building code for the RPP-WTP Project is the 1997 Uniform Building Code (UBC)."

This tailoring is acceptable to the RU. DOE G-440.1 requires the RPP-WTP Contractor to meet the "applicable building code". The tailoring clarifies that the applicable building code for RPP-WTP is the 1997 edition of the UBC, which is consistent with the building code specified in other SRD safety criteria (e.g., 4.1-2, 4.1-3, 4.1-4, and 4.1-5).

##### Section III.6.2:

This section of the guide states that DOE contractors should develop, implement and maintain a comprehensive fire protection program for facilities that includes noncombustible or fire-resistive construction, where appropriate. The section further states that the fire protection program should include complete fire-rated barriers that are commensurate with the fire hazard

to isolate hazardous occupancies and to minimize fire spread and loss potential consistent with defined limits as established by DOE.

The proposed tailoring is to delete the words "and loss potential consistent with defined limits as established by DOE".

The RPP-WTP Contractor proposed this tailoring on the basis that RPP-WTP will be a private facility, owned and operated by BNFL. As such, the limits of loss potential are established by BNFL and its underwriters. However, for the reasons noted above for the proposed change to SRD safety criterion 4.5-4, this tailoring is not warranted at this time and is not acceptable to the RU.

### Section III.6.3:

This section of the guide states that DOE contractors should develop, implement and maintain a comprehensive fire protection program for facilities that includes automatic fire extinguishing systems throughout all significant facilities and in all areas subject to loss of safety class systems, significant life safety hazards, unacceptable program interruption, or fire loss potential in excess of defined limits.

The proposed tailoring is to revise the section to read: "automatic fire extinguishing systems in all areas subject to loss of safety class systems, significant life safety hazards, or unacceptable program interruption. The FHA may justify the omission of such systems based on safety considerations as approved by the AHJ. For the RPP-WTP Project the determination of program interruption acceptability is made by the owner, BNFL Inc." Thus the proposed tailoring deletes "throughout all significant facilities" and "fire loss potential in excess of defined limits" and adds the second and third sentences.

The term "significant facilities" is not defined by the guide. DOE-STD-1066-97, Section 5.3.1 indicates that a facility with a Maximum Possible Fire Loss (MPFL) in excess of one million dollars is significant from a property protection standpoint. Thus, the RPP-WTP Contractor's interpretation is to delete this statement and the fire loss potential statement on the basis that RPP-WTP will be a private facility, owned and operated by BNFL. As such, protection requirements based on property loss and the determination of program interruption acceptability are established by BNFL and its underwriters. For the reasons noted above for the proposed tailoring to SRD Safety Criteria 4.5-4, the proposed tailoring to Section III.6.3, including the proposed third sentence to the safety criterion, is not warranted at this time and is not acceptable to the RU.

The tailoring to add the sentence "the FHA may justify the omission of such systems based on safety considerations as approved by the AHJ" is proposed on the basis that it is consistent with safety criterion 4.5-4 which requires automatic fire suppression "unless the Fire Hazards Analysis dictates otherwise" and is also consistent with the equivalency concept described in DOE G-440.1, Section II. The position that safety considerations, supported by the results of the facility FHA, are an acceptable basis upon which the RPP-WTP Contractor may submit an equivalency request has been discussed in Level 1 meetings between the RU and the Contractor. As such, this proposed tailoring is acceptable to the RU.



Section III.6.4:

This section of the guide states that DOE contractors should develop, implement and maintain a comprehensive fire protection program for facilities that includes redundant fire protection systems in areas where safety class systems are vulnerable to fire damage and where no redundant safety capability exists outside the fire area. In new facilities, redundant safety class systems should be in separate fire areas. Redundant fire protection systems should also be provided in areas where the maximum possible fire loss (MPFL) exceeds limits established by DOE.

The proposed tailoring is to delete the last sentence of this section. The RPP-WTP Contractor proposed this tailoring on the basis that RPP-WTP will be a private facility, owned and operated by BNFL. As such, protection requirements based solely on property loss potential are established by BNFL and its underwriters. However, for the reasons noted above for the proposed change to SRD safety criterion 4.5-4, this tailoring is not warranted at this time and is not acceptable to the RU.

Section IV.4.5:

This section of the guide states that a Fire Hazards Analysis (FHA) should contain, but not be limited to, a conservative assessment of several fire safety issues, including a description of critical process equipment, a description of high value property, damage potential: MPFL and recovery potential.

The proposed tailoring is to change "Description of critical process equipment" to "Identification of Important-to-Safety equipment," and delete "description of high-value property", "damage potential: Maximum Possible Fire Loss (MPFL)", and "recovery potential".

The RPP-WTP Contractor proposed the tailoring dealing with "critical process equipment" on the basis that it is not a well-defined term for the RPP-WTP project. By contrast, the term "important-to-safety" is defined by DOE/RL-96-0004, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for the RPP Waste Treatment Plant Contractor*, and is consistent with the RL/REG-99-05, *Construction Authorization Request (CAR) Review Guidance*. This tailoring is acceptable to the RU.

The tailoring to delete the description of high value property, damage potential: maximum possible fire loss, and recovery potential from being assessed in the FHA, is based on RPP-WTP being a private facility, owned and operated by BNFL. As such, protection requirements based on property loss and recovery potential are established by BNFL and its underwriters. This tailoring is not acceptable to the RU. Under the privatization approach to the RPP-WTP project, there was a reasonable basis for this tailoring. However, given the DOE decision to terminate the contract with BNFL to design and construct the RPP-WTP and uncertainty about the contracting arrangement to be established with the replacement contractor, this tailoring is not warranted at this time.

Section IV.4.16:

This section of the guide states that the fire hazards analysis, including all assumptions, should be documented. When both an FHA and a SAR are developed for a facility, the development effort should be coordinated to the maximum extent possible to avoid duplication of effort. The guide recognizes, however, that because an FHA is based on the premise that a fire will occur and considers fire safety issues (property loss and program discontinuity potential) that are not normally considered in the SAR, the conclusions of the FHA may be more conservative than would normally be developed by a SAR alone. Nevertheless, the FHA and its conclusions should be addressed in the facility SAR in such a manner as to reflect all relevant fire safety objectives as defined in Paragraph 4.2.0.1 of DOE 420.1 and Section 2 of Attachment 1 of DOE 440.1.

The proposed tailoring is to revise this section to read: "The fire hazards analysis, including all assumptions, should be documented. When both an FHA and a SAR are developed for a facility, the development effort should be coordinated to the maximum extent possible to avoid duplication of effort. It is recognized, however, that because an FHA is based on the premise that a fire will occur, the conclusions of the FHA may be more conservative than would normally be developed by a SAR alone. Nevertheless, the FHA and its conclusions should be addressed in the facility SAR in such a manner as to reflect all relevant fire safety objectives as defined in Paragraph 4.2.0.1 of DOE 420.1 and Section 2 of Attachment 1 of DOE 440.1. For the RPP-WTP Project the relevant fire safety objectives of Paragraph 4.2.0.1 of DOE 420.1 are items (1), (2), and (5)."

Thus, the tailoring to Section IV.4.16 deletes "and considers fire safety issues (property loss and program discontinuity potential) that are not normally considered in the SAR" after "...fire will occur" in the third sentence and adds the last sentence. The proposed tailoring is based on RPP-WTP being a private facility, owned and operated by BNFL. As such, property loss and program discontinuity potential are economic issues within the purview of BNFL, in consultation with its underwriters.

These interpretations are not acceptable to the RU for the reasons given above concerning the similar proposed tailoring to Section IV.4.5 of DOE G-440.1.

Section IV.9.7:

Section IV.9.7 addresses the need to include automatic fire suppression systems and redundant fire protection systems in the facility design based upon the potential for property loss due to a fire (MPFL).

The proposed tailoring is to delete the entire section based on RPP-WTP being a private facility, owned and operated by BNFL. As such, the limits of loss potential are established by BNFL and its underwriters, rather than DOE.

This tailoring is not acceptable to the RU for the reasons given above concerning the similar proposed tailoring to Section IV.4.5 of DOE G-440.1.

DOE-STD-1066-97

The proposed tailoring of this DOE standard includes one general interpretation and twelve (12) specific interpretations, as follows:

General:

Interpret references to "DOE" or "DOE AHJ" or "AHJ" as "DOE Regulatory Unit (RU)" wherever these references refer to regulatory functions that have been assigned to the DOE Regulatory Unit.

This interpretation is consistent with the position taken by the RU in Level 1 meetings with BNFL and is acceptable. It clarifies the RU as the AHJ for safety/regulatory-related fire protection issues, while leaving other AHJ responsibilities (i.e., maintenance, testing, inspection of fire protection equipment, fire fighting, permitting, etc.) to other appropriate organizations (e.g., Hanford Site Fire Department).

Section 4:

Section 4 of the standard includes the definitions, wherein the Authority Having Jurisdiction (AHJ) is defined as the decision making authority in matters concerning fire protection. The DOE Head of Field Organization or designee is defined as the final AHJ unless otherwise directed by the Cognizant Secretarial Officer.

The proposed tailoring to this section of the standard is that for the definition of the Authority Having Jurisdiction (AHJ), add the following sentence: "For the RPP-WTP Project, the designated AHJ is the DOE Regulatory Unit."

For the reasons stated above for the general interpretation, this tailoring is acceptable to the RU. However, the tailoring should read: "For the RPP-WTP Project, the DOE Regulatory Unit (RU) is the designated AHJ for radiological, nuclear, and process safety and industrial health and safety issues related to fire protection."

Section 5.1:

Section 5.1 of the standard specifies requirements for fire protection to limit loss potential. Subsection 5.1.1 recommends a redundant fire protection system when potential fire losses (MPFL) exceed \$50 million. Section 5.1.2 recommends a 3-hour fire barrier in addition to the redundant fire protection system when potential fire losses (MPFL) exceed \$150 million.

The proposed tailoring to this section of the standard is to delete subsections 5.1.1 and 5.1.2. The proposed tailoring is based on RPP-WTP being a private facility, owned and operated by BNFL. As such, the limits of loss potential are established by BNFL and its underwriters, rather than DOE.

This tailoring is not acceptable to the RU. As stated earlier, given the DOE decision to terminate the contract with BNFL to design and construct the RPP-WTP and uncertainty about the

contracting arrangement to be established with the replacement contractor, this tailoring is not warranted at this time.

Section 5.3.1:

Section 5.3.1 of the standard states that all facilities of significance, including facilities where a fire could cause unacceptable off-site consequences to health and safety, should be protected by an automatic fire suppression (usually a Wet Pipe Sprinkler System). A decision to install another type of fire suppression system should be based on engineering analysis performed by a fire protection engineer. Per the standard, DOE has, historically, considered a facility with an MPFL in excess of \$1 million as being significant from a property protection standpoint.

The proposed tailoring to this section of the standard is to revise it to read: "Facilities where a fire could cause unacceptable off-site or onsite consequences to health and safety should be protected by an automatic fire suppression system (usually a Wet Pipe Sprinkler System). A decision to omit or to install another type of fire suppression system should be justified by the Fire Hazards Analysis."

The proposed tailoring dealing with facilities of significance is based on RPP-WTP being a private facility, owned and operated by BNFL. As such, protection requirements based on property loss and the determination of program interruption acceptability are established by BNFL and its underwriters.

This tailoring is not acceptable to the RU. As stated previously, given the DOE decision to terminate the contract with BNFL to design and construct the RPP-WTP and uncertainty about the contracting arrangement to be established with the replacement contractor, this tailoring is not warranted at this time.

The proposed tailoring of the sentence dealing with installation of other than an automatic fire suppression system is also not acceptable to the RU. As stated in the RU response above to the proposed interpretation to DOE G-440.1, Section III.6.3, safety considerations, supported by the results of the facility FHA, are an acceptable basis upon which the RPP-WTP Contractor may submit an equivalency request to the RU which justifies not installing an automatic fire suppression system in an area of the RPP-WTP facility. However, in this instance, the first sentence of subsection 5.3.1 clearly states that the basis for the requirement for an automatic fire suppression system is that a fire in the facility could cause unacceptable off-site consequences to health and safety. Presumably, this conclusion was reached as a result of the analysis performed for the facility FHA. Thus, there is no reason to interpret the standard to allow for the automatic fire suppression system to be omitted based on the FHA results. The standard allows for the use of another type of fire suppression system, based on engineering analysis performed by a fire protection engineer. Again, the engineering analysis referred to should be part of or supported by the results of the FHA. Thus, the existing standard gives the RPP-WTP Contractor appropriate flexibility to install alternative fire suppression systems, but not to omit such systems where analyzed off-site consequences to health and safety from fires has been shown to be unacceptable.

Section 5.3.6:

Section 5.3.6 of the standard recommends that standpipes be installed in all structures having three levels or more above or below grade. Standpipe systems should be provided in other structures, such as those with extensive and complex interior layouts, where deemed necessary by the DOE Fire Protection AHJ. Standpipes should be designed and installed as Class 1 systems per NFPA 14.

The proposed tailoring to this section of the standard is to revise the second sentence to read: "Standpipe systems should be provided in other structures, such as those with extensive and complex interior layouts, where deemed necessary by a qualified fire protection engineer, based on the results of the fire hazards analysis and the baseline needs assessment."

The proposed tailoring puts the decision for installing standpipe systems in the RPP-WTP facility in the hands of the Contractor (qualified fire protection engineer) instead of the DOE fire protection AHJ. The basis for the tailoring is that RPP-WTP is a private facility and, as such, the determination of the need for specific fire protection features is the responsibility of the owner rather than DOE.

This tailoring is not acceptable to the RU. As stated earlier, given the DOE decision to terminate the contract with BNFL to design and construct the RPP-WTP and uncertainty about the contracting arrangement to be established with the replacement contractor, this tailoring is not warranted at this time.

Section 8.1:

Section 8.1 of the standard recommends several general features of fire alarm systems, including:

- Installation of visual alarms for the hearing impaired where there are high noise levels or where there are special process requirements, as determined by the DOE Fire Protection AHJ.
- Location of the fire alarm control panel is near the main entrance or a protected location as determined by the AHJ. For buildings with multiple alarm zones, a zone alarm panel or a graphic zone alarm panel at the main entrance to the facility.

The proposed tailoring to this section is to revise the first bullet to read: "Visual alarms for hearing impaired, where there are high noise levels, or where there are special process requirements as determined by a qualified fire protection engineer." Revise the first sentence of the second bullet to read: "The fire alarm control panel located near the main entrance or a protected location as determined by a qualified fire protection engineer."

This tailoring also involves changing the responsibility for determining the location of fire protection equipment from the DOE fire protection AHJ to the RPP-WTP Contractor (qualified fire protection engineer). The basis for the tailoring is that RPP-WTP is a private facility and, as such, the determination of the need for specific fire protection features is the responsibility of the owner rather than DOE. This tailoring is not acceptable to the RU for the reasons noted above for the proposed tailoring of section 5.3.6 of the standard.

Section 9.5.1:

Section 9.5.1 of the standard deals with fire barrier penetration seals and recommends that penetration seal materials and assemblies be tested for their fire resistance and listed by UL or similar nationally recognized testing laboratories, or should be approved by Factory Mutual.

The proposed tailoring to this section is to add the following words: "The fire resistance of special or unique penetration assemblies, such as lead glass windows and shield wall penetrations, may be based on past qualification testing or an equivalency evaluation."

The basis for the proposed tailoring is that the RPP-WTP facility is expected to have unique penetration configurations that may be impractical to test. The tailoring clarifies that alternate approaches that provide a comparable level of safety, as described in Section 1 of DOE-STD-1066-97, may be used. The use of an equivalency evaluation in lieu of testing of special or unique penetration assemblies has been discussed between the RU and the RPP-WTP Contractor in Level 1 meetings. Since all fire protection equivalencies, along with adequate supporting analysis/justification, must be submitted for RU review and approval prior to implementation, this tailoring is acceptable to the RU.

Section 10.4:

Section 10.4 of the standard recommends that, in those areas where an accidental breach of a primary confinement system could expose personnel to radioactive material, a distance of 75 feet, as measured by the method in NFPA 101, should be the maximum travel distance to ensure that personnel can exit through the next confinement.

The proposed tailoring to this section of the standard is to add the following words: "The 75-foot travel distance may be exceeded in areas not normally occupied by personnel, where plant equipment alone is located."

The basis for the proposed tailoring is that if an area is not normally occupied, an accidental breach of a primary confinement system cannot expose personnel to radioactive material. This tailoring has been discussed between the RU and the RPP-WTP Contractor in Level 1 meetings. The RU agrees that, for facility areas not normally occupied by personnel, accidental breaches of the primary confinement should not pose an unacceptable risk to facility personnel. The hazards to facility personnel posed by such accidental breaches should be fully assessed by the RPP-WTP Contractor's integrated safety management program and hazard analyses. If appropriate, design basis events relating to such breaches should be identified and, if necessary, subjected to detailed accident analysis. These processes are expected to ensure that unacceptable hazards to facility personnel are eliminated from the design and operation of the RPP-WTP facility. As such, this interpretation is acceptable to the RU.

Section 10.6.3:

Section 10.6.3 of the standard recommends that exit requirements for toxic and explosive environments be as determined by the AHJ. In addition, for explosive environments, exits should reflect the criteria contained in the DOE Explosives Safety Manual (DOE M 440.1-1).

The proposed tailoring to this section of the standard is to revise this section to read: "Exit requirements for toxic and explosive environments should be as determined by a qualified fire protection engineer."

The proposed tailoring again involves changing the responsibility for determining fire protection requirements from the DOE fire protection AHJ to the RPP-WTP Contractor (qualified fire protection engineer). The basis for the tailoring is that RPP-WTP is a private facility and, as such, the determination of the need for specific fire protection features is the responsibility of the owner rather than DOE. This interpretation is not acceptable to the RU for the reasons noted above for the proposed tailoring of section 5.3.6 of the standard.

The proposed tailoring also deletes the section 10.6.3 statement that: "In addition, for explosives environments, exits should reflect the criteria contained in the DOE Explosives Safety Manual (DOE M 440.1-1)." The basis for this tailoring is that the standard requirement applies to environments with munitions and, therefore, is not applicable to RPP-WTP. This tailoring is acceptable to the RU.

#### Section 11.3:

Section 11.3 of the standard recommends that where multi-tiered cable trays are installed in configurations that represent a significant fire hazard (as determined by the FHA), they should be provided with fire protection/suppression as determined by the AHJ.

The proposed tailoring to this section of the standard is to revise this section to read: "Where multi-tiered cable trays are installed in configurations that represent a significant fire hazard (as determined by the FHA), they should be provided with fire protection/suppression as determined by a qualified fire protection engineer, consistent with the results of the FHA."

The proposed tailoring again involves changing the responsibility for determining fire protection requirements from the DOE fire protection AHJ to the RPP-WTP Contractor (qualified fire protection engineer). The basis for the tailoring is that RPP-WTP is a private facility and, as such, the determination of the need for specific fire protection features is the responsibility of the owner rather than DOE. This tailoring is not acceptable to the RU for the reasons noted above for the proposed tailoring of section 5.3.6 of the standard.

#### Section 11.4:

Section 11.4 of the standard reads: "Where required by the SAR, critical facilities should be served by dedicated, redundant electric circuits. The two services should be separated by 4-hour fire-rated construction and should be served from separate sources. In lieu of providing two separate services, a single service supplied from a loop-type transmission or distribution system having sectionalizing features may be provided when the reliability of the single service proves adequate when considered in conformance with IEEE 399 and IEEE 493. Locations where fire can damage both normal and emergency power should be protected by redundant fire protection systems."

The proposed tailoring to this section of the standard is to revise this section to read: "Where required by the SAR, critical facilities should be served by dedicated, redundant electric power

services. External to the building served, the two services should be separated by 4-hour fire-rated construction and should be served from separate sources. Separation may be less than 4-hour (minimum 2-hour) where the services are protected by automatic fire detection and suppression systems and justification is provided in the FHA. In lieu of providing two separate services, a single service supplied from a loop-type transmission or distribution system having sectionalizing features may be provided when the reliability of the single service proves adequate when considered in conformance with IEEE 399 and IEEE 493. Locations where fire can damage both normal and emergency power should be protected by redundant fire protection systems."

The first part of the tailoring of this section involves the substitution of "electric circuits" with "electric power services" in the first sentence and insertion of "External to the buildings served" into the second sentence. The basis for this proposed tailoring is that the term "power services" is more consistent with the sentence that follows. The proposed tailoring clarifies that the requirement in the standard applies to site power supplies and not to cable routing within the buildings served. The requirements for cable routing within the process buildings are addressed elsewhere in the SRD (Safety Criterion 4.4-10). The proposed tailoring has been discussed with the RPP-WTP Contractor in Level 1 meetings and is acceptable to the RU.

The second part of the tailoring is the addition of the sentence "Separation may be less than 4-hour (minimum 2-hour) where the services are protected by automatic fire detection and suppression systems and justification is provided in the FHA." The basis for the proposed tailoring is that the use of a minimum 2-hour fire barrier separation combined with automatic fire detection and suppression provides a level of safety equivalent to a 4-hour fire barrier. The proposed tailoring has been discussed with the RPP-WTP Contractor in Level 1 meetings. In general, the RU agrees that a safety case can be made that a minimum 2-hour fire barrier for a fire area that is protected by automatic fire detection and suppression provides equivalent fire safety to that provided by a 4-hour fire barrier alone. This statement is based on the assumption that the facility FHA provides objective evidence of the equivalent fire safety provided by the installed fire structures, systems, and components. However, the proposed tailoring represents a request for a blanket equivalency without the benefit of the supporting fire hazards analysis results. Section 1 of DOE-STD-1066-97 allows the Contractor to propose alternate approaches that provide a comparable level of safety to that achieved by conformance with the standard. The proposed tailoring provides no evidence that a comparable level of safety will be achieved. As such, the proposed tailoring is not acceptable to the RU.

#### Section 12.4:

Section 12.4 of the standard addresses fire protection requirements for process furnaces.

The proposed tailoring to this section of the standard is to delete this section.

Since RPP-WTP has no gas-fired process furnaces, the section is not applicable. The proposed tailoring is acceptable to the RU.



Section 13:

Subsections 13.2, 13.3, 13.4, 13.5, 13.6, and 13.7 of the standard address fire protection requirements for plutonium processing and handling facilities, plutonium storage facilities, enriched uranium storage facilities, uranium processing and handling facilities, fuel reprocessing facilities, and uranium conversion and recovery facilities, respectively.

The proposed tailoring to this section of the standard is to delete Subsections 13.2, 13.3, 13.4, 13.5, 13.6, and 13.7.

Since RPP-WPT does not fall within the category of a plutonium processing and handling, plutonium storage, enriched uranium storage, uranium processing and handling, fuel reprocessing, or uranium conversion and recovery facility, the requirements of these subsections are not applicable. The proposed tailoring is acceptable to the RU.

NFPA 801-95

The proposed tailoring of this NFPA standard includes one general interpretation and two (2) specific interpretations, as follows:

General:

Interpret references to "AHJ" as "DOE Regulatory Unit (RU)" wherever these references refer to regulatory functions that have been assigned to the DOE Regulatory Unit.

This interpretation is consistent with the position taken by the RU in Level 1 meetings with BNFL and is acceptable. It clarifies the RU as the AHJ for safety/regulatory-related fire protection issues, while leaving other AHJ responsibilities (i.e., maintenance, testing, inspection of fire protection equipment, fire fighting, permitting, etc.) to other appropriate organizations (e.g., Hanford Site Fire Department).

Section 3-8:

Section 3-8 of NFPA 801-95 reads as follows:

"3-8.1 Interior finish in areas processing or storing radioactive materials shall be noncombustible and, where practicable, shall be nonporous for ease of decontamination.

3-8.2 Interior finish in areas not critical to the processing of radioactive materials shall be Class A or Class B in accordance with NFPA 101, *Life Safety Code*."

Section 3-8 of NFPA 801-98 reads as follows:

"Interior finish in areas processing or storing radioactive materials shall be limited-combustible and, where practicable, shall be nonporous for ease of decontamination."

The proposed tailoring to this section of the standard is to replace the entire section with the text of the same section from the 1998 version of NFPA 801.

The basis for the proposed tailoring is that the NFPA standard was revised in recognition of the impracticality of using only noncombustible surface finishes in areas processing or storing radioactive materials. Conformance with the revised standard will permit the use of limited combustible interior finishes.

Although it does represent a reduction in commitment, the proposed tailoring is acceptable to the RU. Liquid radioactive waste within the RPP-WTP Project is contained within tanks and piping systems. Where there is a possibility of a leak or spill, the RPP-WTP Contractor plans to provide a stainless steel lining for cell surfaces that could come into contact with the waste. Elsewhere, the RPP-WTP Contractor plans to use coatings of limited combustible material to seal the concrete and facilitate decontamination. Many decontaminable coatings contain some combustible constituent. As such, use of these coatings would not be allowed by the 1995 edition of NFPA 801; thus, degrading the ability to decontaminate cell surfaces within the facility. Since the combustible constituents present in any coating material installed within RPP-WTP must be addressed in the facility Fire Hazards Analysis (FHA), which is submitted to the RU for approval, the RU considers this tailoring to have an insignificant impact to the fire safety of the facility.

#### Section 6.1.1:

Section 6.1.1 of the standard lists the NFPA standards or portions thereof which are referenced within the text of NFPA 801-95.

The proposed tailoring to this section of the standard is to change the code edition for NFPA 70 from 1993 to 1996 and the code edition for NFPA 780 from 1992 to 1995.

The basis for the proposed tailoring is that SRD safety criteria 4.3-2 and 4.4-12 reference these more recent editions of NFPA 70 and NFPA 780 as implementing standards. This tailoring resolves the conflict with NFPA 801.

The proposed tailoring is acceptable to the RU. The tailoring does not represent a reduction in commitment; rather, it merely resolves a code edition reference inconsistency within the SRD. Referencing the later editions of the NFPA codes has no impact on the fire safety of the RPP-WTP facility.